

PROJECT AVGIL: APPRENTICE AND VOLUNTEER GUIDE IN LEARNING MATHEMATICS

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Abstract

The COVID-19 pandemic has significantly disrupted education worldwide, posing challenges for both students and teachers, particularly in the Philippines. This paper addresses the urgent need to close learning gaps in higher education and improve student performance through innovative strategies. Teachers now find themselves creating supplementary instructional materials to aid students in their recovery process. In response, this study enhances Project AVGIL: “Apprentice and Volunteer Guide in Learning,” an initiative founded by Mr. Avgil Poblete Megino. Project AVGIL trains volunteers and apprentice learning facilitators to develop instructional materials for Mathematics, specifically targeting Junior High School learners.

The primary objective is to institutionalize knowledge transfer in Agriculture and Business Education (ABE) and Bachelor of Technical-Vocational Teacher Education (BTVTE) programs by building partnerships with public and private sectors. Specific goals include enhancing existing instructional materials, assisting teachers in creating supplementary resources, engaging students through localized content, and improving academic performance.

Using self-learning modules from DepEd Bataan as a foundation, the project focuses on the creation of contextualized instructional resources. Volunteers, regardless of their academic backgrounds, are encouraged to participate in training sessions on developing PowerPoint presentations, radio-based instructional scripts, and online teaching formats. The training sessions were held across four weeks in April 2024, culminating in the production of instructional materials for the fourth quarter.

Final evaluations by faculty members and the distribution of these materials to various junior high schools in Bataan were completed by May 31, 2024. Feedback from Mathematics teachers indicated positive reception and interest in additional instructional resources. This initiative not only supports public school educators but also prepares ABE and BTVTE students for future educational challenges, fostering a collaborative learning environment.

Keywords: COVID-19, Education, Instructional Materials, Mathematics, Project AVGIL, Learning Recovery, ABE, BTVTE, Educational Innovation

Introduction

The global educational landscape experienced significant disruption due to the Corona Virus Disease-2019 (CoViD-19) crisis, affecting not only the Philippines but also countries worldwide. This unprecedented situation posed considerable challenges, particularly for students and teachers, in addressing the widening learning gaps. These gaps serve as the fundamental building blocks for various learning areas in higher education. Educators have faced the dual responsibility of delivering quality instruction while simultaneously creating innovative materials to support students in the learning recovery process.

In response to these challenges, there is a pressing need for strategies that enhance student learning and bridge existing gaps in education. Teachers are not only tasked with delivering instruction but also with devising tools and resources that promote learning recovery and improved academic performance. Among these strategies is the development of instructional materials that serve as supplemental resources, aiding students in their educational journey.

Recognizing this need, the proponent aims to enhance and utilize Project AVGIL: Apprentice and Volunteer Guide in Learning. Initially introduced by Mr. Avgil Poblete Megino, a former Department of Education (DepEd) Bataan teacher and current Mathematics

Instructor at Bataan Peninsula State University (BPSU) Abucay Campus, this project has proven to be an effective innovation. Project AVGIL is a training program designed for students and teachers to become volunteer learning facilitators. It equips them with the skills to create instructional materials for Mathematics, such as slide presentations and video lessons. These materials serve as guides for Junior High School students in their learning recovery efforts and supplement existing modules.

Furthermore, the continuation and enhancement of Project AVGIL have broader implications. The project not only assists public school teachers and students but also prepares future educators and professionals, particularly those in the Bachelor of Science in Agricultural and Biosystems Engineering (BSABE) and Bachelor of Technical-Vocational Teacher Education (BTVTEd) programs. These programs rely heavily on foundational Mathematics, which is critical for Engineering Mathematics and teaching common competencies in Information and Communications Technology (ICT).

This study, therefore, seeks to institutionalize knowledge transfer between BSABE and BTVTEd programs by strengthening linkages and partnerships with government units and private sectors. Specifically, the study aims to enhance the instructional materials created under the initial implementation of Project AVGIL in 2020, assist public school teachers in developing Mathematics resources, engage students through localized and contextualized instructional materials, and improve overall student academic performance.

By addressing these objectives, the study underscores the importance of innovative teaching practices and collaborative efforts in overcoming the educational challenges brought about by the CoViD-19 pandemic. The subsequent sections of this paper will outline the methodology, findings, and implications of this initiative, highlighting its potential to contribute to the improvement of the educational system and the preparation of future educators and professionals.

Methods

Research Design

This study employed a participatory action research design, where collaboration between educators, students, and volunteers was central to achieving the objectives. The approach focused on enhancing Project AVGIL by developing contextualized and localized instructional materials for Junior High School Mathematics. This design was chosen to ensure active involvement of participants and to align with the project's goal of improving educational outcomes through collective efforts.

Participants

The participants in this study included volunteers and apprentices from the Bachelor of Science in Agricultural and Biosystems Engineering (BSABE) and Bachelor of Technical-Vocational Teacher Education (BTVTEd) programs at Bataan Peninsula State University (BPSU) Abucay Campus. Volunteerism was open to all students, regardless of educational background, as long as they were willing to undergo training and contribute to the creation of instructional materials. A total number of recipients from three schools—Bangkal High School, Limay National High School, and Palili Integrated School—were identified as beneficiaries of the project. The beneficiaries included Mathematics teachers, as detailed in Table 1.

Table 1. *Recipient and Beneficiaries*

School	Teachers
Bangkal High School	Jennelyn M. Reyes
	Celeste B. Reyes
	Jessamine M. De Jesus
	Maria Concepcion V. Macalinao
	Donnalyn V. Dominguez
	Maria R. Sambal
Limay National High School	Roderic R. Cunanan
	Chapito G. Baluyot
	Rysy May G. Constantino
	Danalyn G. Arabis
	Ma. Sherry M. Aririt
	Loida F. Hatol
	Lea M. Antalan
	Sandra M. Boringot
	Mayflor V. Manuel
	Rocchely N. Bellisa
	Evangeline O. Firaza
	Mharicon M. Cruz
	Ruth R. Castro

Palili Integrated School	Edrose S. Abad
	Pauline L. Rodriguez
	Marcelo S. Saligumba
	Liky C. Lamon
	Ana Margarita G. Capule
	Janine Ashley B. Rodis
	Lornita V. Jimeno
	Shiela Donna G. Isidro
	Maricel A. Buan
	Ma. Merasol L. Magtanong
	Leah Mae R. Rodis
	Sarah N. Layola
	Lani M. Naty
	Rozen D. Cabonias

Data Collection Procedures

The instructional materials were developed based on ready-made Self-Learning Modules (SLMs) created by the Department of Education (DepEd) Bataan. The project followed these steps:

1. Call for Volunteers: A campaign for volunteerism was conducted, inviting BSABE and BTVTEd students to join as apprentices.
2. Training Sessions: Volunteers underwent a series of training workshops, including "Developing a PowerPoint Presentation," "Radio-Based Instruction Scriptwriting and Recording," and "Live Streaming Format for Online Teaching."
3. Material Development: Participants created instructional materials such as PowerPoint presentations, video lessons, and modules using the SLMs as reference materials. Each participant was required to produce at least one localized or contextualized instructional material.
4. Review and Validation: All instructional materials were submitted via Google Drive and reviewed by the project proponents. Feedback was provided, followed by a final review conducted by the Education Program Supervisor of SDO Bataan.
5. Distribution: The validated materials were distributed to Junior High School Mathematics teachers in the division of Bataan.
- 6.

Data Analysis

The analysis involved correlating students' Mathematics grades from previous and latter quarters to assess the impact of the instructional materials on academic performance. Additionally, teachers were provided with evaluation forms to rate the effectiveness of the developed instructional materials based on their usability and alignment with SLMs.

Ethical Considerations

Informed consent was obtained from all participants. Confidentiality was ensured by securely managing data and limiting access to project proponents. Risks were minimized as the study focused on developing and enhancing instructional materials rather than intervening directly in students' learning processes.

Monitoring and Evaluation Plan

The monitoring and evaluation of the project were carried out through a series of structured activities to ensure its success. Participants underwent training on creating instructional materials based on guidelines established by DepEd. These materials, which included PowerPoint presentations, video lessons, and modules, were created using SDO Bataan Mathematics modules as references for developing localized and contextualized instructional resources. The completed materials were submitted through a designated Google Drive folder, where project proponents conducted an initial review and provided feedback. Revisions were made based on this feedback, and the materials underwent a final review by the SDO Bataan Education Program Supervisor before being validated and distributed to junior high schools in Bataan.

Before implementation, meetings were held with the recipients to explain the objectives of the program and provide guidelines for its application. The Mathematics grades of students from the previous quarter were collected and used as baseline data for comparison with their grades after using the developed materials. Additionally, teachers who utilized the instructional materials completed evaluation forms to assess their quality and relevance. Monitoring and evaluation activities were conducted quarterly, ensuring the program's sustainability and effectiveness over the course of the project.

Validity and Reliability

To ensure the validity and reliability of the instructional materials and the research findings, a rigorous process was followed. All developed materials were reviewed in accordance with established DepEd guidelines and validated by experts, including the SDO Bataan Education Program Supervisor. Feedback from the project proponents was incorporated into the materials to ensure they aligned with the goals of localized and contextualized learning. Pilot testing was conducted in selected schools to evaluate the materials' effectiveness and relevance. Data from teachers' evaluations and students' performance were analyzed to assess reliability. Adjustments were made based on the evaluation results to maintain high standards throughout the duration of the project.

Results

The implementation of Project AVGIL yielded significant results, meeting its objective of enhancing the educational experience for Junior High School Mathematics students in Bataan. The following presents the outcomes of the study, categorized into key areas:

1. Collection of Modules

From February 19 to 29, 2024, the project team successfully collected 100% of the Junior High School Mathematics modules for the fourth quarter. This achievement was made possible through close collaboration with the Schools Division Office (SDO) Bataan, including the Schools Division Superintendent (SDS) and the Education Program Supervisor (EPS) in Mathematics. The comprehensive collection of modules provided a solid foundation for developing localized and contextualized instructional materials.

2. Capacity-Building of Volunteers

A training workshop was held on March 7 and 8, 2024, to equip volunteers and apprentices with the necessary skills to create instructional materials based on DepEd guidelines. The training covered essential techniques in instructional material development, empowering participants to contribute effectively to the project. A total of Php 10,000 was allocated for this activity, ensuring the successful professional development of all attendees.

3. Development of Instructional Materials

Between March 11 and 22, 2024, the project team, composed of volunteers and apprentices, developed localized and contextualized instructional materials tailored to the Junior High School Mathematics modules collected from SDO Bataan. These materials addressed all topics outlined for the fourth quarter, ensuring comprehensive coverage. A budget of Php 50,000 was utilized for this phase, supporting the collaborative effort to create high-quality educational resources.

4. Validation and Distribution of Materials

The developed materials underwent a validation process on October 4, 18, and 29, 2024. This step included feedback sessions with Mathematics Department heads to ensure that the materials met DepEd's educational standards. Following validation, the instructional materials were distributed to Junior High School Mathematics teachers across Bataan. The validation and distribution phase were supported by an additional budget of Php 10,000.

Each phase of the project was executed according to the planned timeline, ensuring the successful completion of activities and alignment with the project's objectives.

A learning resources evaluation tool from DepEd was used to validate the materials during the phase I of implementation. This tool consist of ratings for (1) Content, (2) Format, (3) Presentation and Organization, and (4) Accuracy and Up – to – datedness of the information.

In a scale of 1 – 4, the recipients evaluated the materials in terms of content, a total average score of 21.844 out total score of 28, which implies that materials passed this criterion, as the learning materials should score 21 in order to pass. It shows that the developed supplemental materials rated very satisfactory in indicators 1, 2, 3 and 6, while satisfactory in indicators 4, 5, and 7.

Table 2. *Evaluation Results of Developed Instructional Materials as Perceived by JHS Mathematics Teachers, in terms of Content*

	Description	Average Rating
1	Content is suitable to the student's level of development	4.0
2	Material contributes to the achievement of the specific objectives of the subject area and grade/year level for which is intended	4.0
3	Material provides for the developments of the higher cognitive skills such as critical thinking, creativity, learning by doing, inquiry, problem solving, etc.	4.0
4	Material is free of ideological, cultural, religious, racial, and gender biases and prejudices	3.39
5	Materials enhances the development of desirable values and traits such as: a. Pride of being a Filipino b. Spiritual and emotional c. Cognitive d. Love for country e. Helpfulness/Teamwork/Cooperation f. Unity g. Desire to learn new things h. Honesty and trustworthiness i. Ability to know right from wrong j. Respect k. Gross motor l. Productive Work m. Independence and initiative n. Love for oneself, family and community	3.45
6	Material has the potential to arouse interest of target reader	4.0
7	Adequate warning/symbols are provided in topics and activities where safety and health are of concern	3.0

Table 3. *Evaluation Results of Developed Instructional Materials as Perceived by JHS Mathematics Teachers, in terms of Format*

	Description	Average Rating
A. Text		
1	Size of letters	4.0
2	Spaces between letters and words facilitate reading	4.0
3	Font is easy to read	4.0
4	Printing is of good quality	4.0
Illustrations		
1	Simple and easily recognizable	4.0
2	Clarify and supplement the text	4.0
3	Properly labeled or captioned (if applicable)	4.0
4	Realistic/ appropriate colors	4.0
5	Attractive and appealing	4.0
6	Culturally relevant	4.0
C. Design and Layout		
1	Attractive and pleasing to look at	4.0
2	Simple (i.e. does not distract the attention of the reader)	4.0
3	Adequate illustration in relation to text	4.0
4	Harmonious blending of elements (e.g. illustrations and text)	4.0
D. Paper and Binding		
1	Paper used contributes to easy reading	2.0
2	Durable binding to withstand frequent use	2.0
E. Size and Weight of Resources		
1	Easy to handle	4.0
2	Relatively light	4.0

In a scale of 1 – 4, the recipients evaluated the materials in terms of format, a total average score of 68 out total score of 72, which implies that materials passed this criterion, as the learning materials should score 54 in order to pass. The developed supplemental materials were evaluated rated very satisfactory in almost of the indicators, however, fair in the paper used and durable binding due to limited number of pieces.

Table 4. *Evaluation Results of Developed Instructional Materials as Perceived by JHS Mathematics Teachers, in terms of Presentation and Organization*

	Description	Average Rating
1	Presentation is engaging, interesting and understandable	4.0
2	There is logical and smooth flow of ideas	4.0
3	Vocabulary level is adapted to target reader's likely experience and level of understanding	4.0
4	Length of sentences is suited to the comprehension level of the target reader	4.0

5	Sentences and paragraph structures are varied and interesting to the target reader	4.0
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In a scale of 1 – 4, the recipients evaluated the materials in terms of presentation and organization, a total average score of 20 out total score of 20, which implies that materials passed this criterion, as the learning materials should score 15 in order to pass. The developed supplemental materials were evaluated rated very satisfactory in all indicators, as these were contextualized and localized to address the real setting of the school – recipients.

Table 5. Evaluation Results of Developed Instructional Materials as Perceived by JHS Mathematics Teachers, in terms of Accuracy and Up-to-Datedness of Information

	Description	Average Rating
1	Conceptual errors	4.0
2	Factual errors	4.0
3	Grammatical errors	4.0
4	Computational errors	4.0
5	Obsolete information	4.0
6	Typographical and other minor errors (e.g. inappropriate or unclear illustrations, missing, labels, wrong captions, etc.)	4.0

In a scale of 1 – 4, the recipients evaluated the materials in terms of accuracy and up-to-datedness of information, a total average score of 24 out total score of 24, which implies that materials passed this criterion, as the learning materials should score 24 in order to pass. The developed supplemental materials were evaluated rated very satisfactory in all indicators, as these materials were also reviewed by the extension program members and validated by the counterpart agency.

Discussion

The results of Project AVGIL highlight its significant contribution to addressing the educational challenges faced by Junior High School Mathematics learners in the Philippines, particularly in the aftermath of the COVID-19 pandemic. The findings underscore the effectiveness of the initiative in achieving its objectives of developing responsive, localized instructional materials and fostering collaborative partnerships among key stakeholders in education.

The project's systematic approach to collecting and validating instructional materials ensured the alignment of resources with DepEd standards, enhancing their applicability in real-world classroom settings. The active involvement of the Schools Division Office (SDO) Bataan and key stakeholders, such as the Schools Division Superintendent (SDS) and

Education Program Supervisor (EPS) in Mathematics, was pivotal in achieving this success. This finding aligns with previous research emphasizing the importance of stakeholder collaboration in creating effective educational interventions.

The professional development of volunteers and apprentices, through training workshops, proved vital in ensuring the quality and contextualization of the instructional materials. This result mirrors existing literature that highlights the role of capacity-building initiatives in empowering educators and volunteers to deliver high-quality educational resources. Moreover, the localized and contextualized nature of the developed materials contributes to the growing body of research advocating for context-specific approaches to addressing learning gaps.

The positive feedback received from Junior High School Mathematics teachers during the validation and distribution phases underscores the practical relevance and acceptance of the instructional materials. This feedback reflects not only the effectiveness of the collaborative process but also the necessity of continuous engagement with educators to refine and enhance resource development. The study contributes new insights into the importance of feedback mechanisms in ensuring the sustainability and usability of educational interventions.

The practical implications of the study are evident in its success in creating a replicable model for addressing learning gaps. The collaboration between academic institutions, government entities, and volunteers demonstrates the potential for collective action in tackling systemic challenges in education. These findings highlight the need for ongoing partnerships and resource-sharing initiatives to sustain the improvements achieved through Project AVGIL.

While the study successfully met its objectives, it is important to acknowledge certain limitations. The focus on a specific geographic area, SDO Bataan, may limit the generalizability of the findings to other regions. Additionally, the project's reliance on existing resources and training may introduce variability in the quality of the developed materials. Future studies could address these limitations by expanding the scope of similar projects and exploring more standardized training methods for participants.

The theoretical implications of this study lie in its demonstration of how collaborative frameworks can enhance the quality and applicability of educational resources. By engaging multiple stakeholders and leveraging localized expertise, Project AVGIL advances our understanding of effective strategies for addressing learning gaps in Mathematics education.

In conclusion, Project AVGIL represents a significant step forward in institutionalizing knowledge transfer within education programs while fostering sustainable collaborations. Its success underscores the importance of maintaining and expanding such initiatives to ensure

that students are equipped to overcome educational challenges in an ever-evolving learning environment.

Conclusion and Recommendation

Building on the successful implementation and outcomes of Project AVGIL, the following recommendations are proposed to guide future initiatives aimed at improving Mathematics education for Junior High School learners:

1. Strengthen Collaboration with Educational Stakeholders

Foster sustained partnerships with local government units, educational institutions, and non-governmental organizations (NGOs). Conduct regular consultations and collaborative meetings to exchange insights, resources, and strategies. These collaborations will help create a more cohesive and adaptive curriculum delivery framework that meets the evolving needs of students.

2. Establish Ongoing Professional Development

Develop a structured, continuous professional development program for teachers and volunteers. This should include workshops, peer-learning sessions, and online courses to keep educators updated on the latest pedagogical methods and educational technologies. Sustained training will empower educators to deliver more effective and innovative instruction.

3. Develop a Comprehensive Feedback Mechanism

Implement a structured feedback system to collect regular input from teachers and students regarding the instructional materials and teaching methodologies. Use this feedback to refine and improve resources iteratively, ensuring they remain relevant and effective for various learning contexts.

4. Expand Resource Development

Diversify instructional resources to include supplementary materials such as digital content, interactive modules, and multimedia resources. These materials should cater to different learning preferences and enhance student engagement through interactive and visually appealing formats.

5. Encourage Localized Content Development

Promote the integration of local contexts, cultures, and examples into instructional materials. By making learning relevant to the students' surroundings, these localized resources can enhance their understanding of mathematical concepts and improve learning outcomes.

6. Incorporate Technology in Teaching Practices

Provide teachers with training on integrating technology into their classrooms. Focus on utilizing educational software, online platforms, and interactive tools that promote

collaborative and active learning. This integration will modernize the teaching process and make it more appealing to digitally native students.

7. Engage Parents and the Community

Design initiatives that actively involve parents and community members in the education process. Conduct workshops, informational sessions, and outreach programs to build a supportive network that reinforces learning outside of school settings.

8. Monitor and Document Progress

Develop a systematic monitoring and documentation process to track the project's activities, successes, and challenges. Regular evaluation will provide valuable insights for replicating effective strategies and addressing areas needing improvement.

9. Secure Funding for Sustainability

Identify and pursue additional funding opportunities from private sector organizations and grant-making bodies. Establishing a strong financial foundation will ensure the long-term sustainability and scalability of the project.

By implementing these recommendations, future initiatives can further build upon the achievements of Project AVGIL, ensuring the sustained improvement of Mathematics education in Junior High Schools. These actionable steps will help address gaps in the current system, create a more inclusive learning environment, and prepare students to excel in their academic pursuits.

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